

## Exploring Gender Differences in Quality of Life

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### Abstract

**Purpose:** The purpose of this study was to examine gender differences with regard to physical activity, psychiatric symptoms, and quality of life in patients with severe mental illness. In addition, associations between the variables were explored.

**Methodology:** A cross-sectional design was employed. Eighteen patients, 12 men and six women, were assessed at admission to hospital with the International Physical Activity Questionnaire, the Hospital Anxiety and Depression Scale, and the WHO Quality of Life – Bref. Mann-Whitney *U*-tests, Spearman's correlation coefficient, and partial correlation were used in the statistical analyses.

**Findings:** Women had lower levels of quality of life and trended towards being more depressed than men, whereas men had more global psychiatric symptoms. When controlling for depression in the participants, the bivariate relationships between male gender and higher quality of life were weakened. The findings indicate that the initial association between gender and quality of life may be mediated by depression levels.

**Practical implications:** Women with severe mental illness tend to have more depression and lower quality of life than their male counterparts, and combating depression appears to be important for increasing quality of life in women with severe mental illness.

**Value:** This is the first explorative study of gender differences in hospitalized patients with severe mental illness.

### **Exploring Gender Differences in Quality of Life**

Over the last years, researchers have investigated different aspects of the lives of the severely mentally ill, including physical activity, anxiety and depression symptoms, and quality of life (Brown et al. 1999; Conley et al. 2006; Huppert and Smith 2005). A gender perspective, though, has not often been applied with this group. As physical activity, psychiatric symptoms, and quality of life may be complexly interrelated with gender, such a perspective may be important for treatment considerations.

Persons with severe mental illness are often physically inactive (Brown, Birtwistle, Roe, & Thompson 1999; Daumit et al. 2005) and have poor physical functioning as compared to the age-matched normal population (Chafetz et al. 2006). A poor lifestyle of physical inactivity, excessive cigarette smoking, and a diet rich with fat and sugar increases the risk of serious somatic illnesses (McCreadie 2003; Sokal et al. 2004). Assuming that physical activity patterns in men and women with severe mental illness mirror that of the general population (Biddle and Mutrie 2008), women may be particularly at risk.

Depression and anxiety are frequent in persons with severe mental illness (Conley, Ascher-Svanum, Zhu, Faries, & Kinon 2006; Huppert & Smith 2005), and have been shown to detract from a sense of well-being and quality of life (Conley, Ascher-Svanum, Zhu, Faries, & Kinon 2006; Eack and Newhill 2007; Norholm and Bech 2006). The relationship between gender and psychiatric symptoms has received less attention with this group. Two recent publications, however, suggest that women with schizophrenia are more depressed than their male counterparts (Abel et al. 2010; Morgan et al. 2008), confirming the gender pattern in the general population (Bekker and van Mens-Verhulst 2007; Zender and Olshansky 2009).

Given the probability of a long term treatment perspective for the severely mentally ill, quality of life is increasingly used as outcome in studies targeting this client group (Xiang et al. 2010). Quality of life is demonstrated to be lower in schizophrenia patients as compared to

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the general population (Xiang et al. 2007), although higher as compared to clients with mood disorders or neurotic disorders (Priebe et al. 2010).

The role of gender in relationship to quality of life in the severely mentally ill has received relatively little research attention. The general finding is a lack of association; i.e., relationships between gender and quality of life have generally not been detected (Bechdolf et al. 2003;Priebe, Reininghaus, McCabe, Burns, Eklund, Hansson, Junghan, Kallert, van Nieuwenhuizen, Ruggeri, Slade, & Wang 2010;Thornicroft et al. 2002). However, in a recent study from Beijing and Hong Kong, male gender was associated with higher quality of life in the physical domain (Xiang, Weng, Leung, Tang, Chan, Wang, Han, & Ungvari 2010). Contrasting results were found in a Brazilian study, where male gender was associated with low quality of life, as was a low level of education (Cardoso et al. 2005). Quality of life subdomains have been reported as differently related to gender, as Thornicroft et al (2002) found men to have higher scores on the ‘family life’ subscale, whereas women had higher scores on the ‘leisure’ subscale.

The role of gender has not been the focus of much research in relation to quality of life in the severely mentally ill. The results to date have indicated no association between the variables or have been somewhat conflicting. The studies available all address persons with schizophrenia who are in a stable phase of illness and living in the community. Thus, results from previous studies may not be fully applicable to patients receiving comprehensive treatment in a hospital context. The aim of this exploratory study was to examine the differences between men and women with severe mental illness in a hospital context with respect to physical activity, psychiatric symptoms, and quality of life. In addition, associations between sociodemographic variables, physical activity, psychiatric symptoms, and quality of life were explored.

## **Method**

### **Clinical context and sample**

The psychiatric department at Oslo University Hospital, from which the sample in this study was recruited, is rurally located about 30 km outside of Oslo, Norway. The department consisted of four wards, each of these having between eight and 15 patients admitted. Two of the wards had the primary task of providing observation, assessment, and shorter term treatment (between three and six months stay), whereas the other two wards provided longer term treatment and care for patients with more chronic conditions (between six months and two years stay). As we wanted the sample to mirror the diverse clinical reality of the department, all the admitted patients were considered eligible for participating in the study, regardless of diagnosis. Excluded were only those unable or unwilling to give informed consent to participate.

### **Recruitment and data collection**

The study had a cross-sectional design. Data were collected shortly after the patients' admission to the psychiatric department. Some of the patients were recruited for participation in the study later during the course of treatment due to inability or unwillingness to participate from the beginning.

Data were collected between May 2009 and November 2010. Information regarding age, gender, education levels, and global functioning levels were collected from routine data. Education was treated as a categorical variable with the assigned values 1 (9 years education or less), 2 (10-12 years), 3 (13-15 years), and 4 (16 years education or more). Data for anxiety and depression levels, physical activity levels, and quality of life were collected from self-report questionnaires that were filled out by the participants at the time of recruitment. When considered needed, the author (on-site project leader) collected these data by interviewing the patients.

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### Measures

#### *Functioning*

The Global Assessment of Functioning (GAF) (American Psychiatric Association 1994) is divided into a symptom severity scale (GAF-S) and a functional ability scale (GAF-F). Both scales range from 0 (least functional ability/most symptomatic distress) to 100 (best functional ability/no symptomatic distress). In general, GAF scores below 60 indicate problems in maintaining ordinary work status, whereas scores below 40 indicate psychotic functioning (American Psychiatric Association, 1994). The GAF scores were assigned by each patient's individual therapist.

#### *Physical activity*

The International Physical Activity Questionnaire (IPAQ) measures days with strenuous physical activity, moderate physical activity, and walking during the last week, and for how long this activity lasted on a usual day. Examples of activities that are considered strenuous and moderate in intensity are provided in the questions. Energy use (MET [metabolic equivalent task] minutes per week) for each type of activity was calculated according to standard procedure (IPAQ committee 2005). The procedure calculates strenuous activity, on average, as demanding eight times the energy spent while inactive (sitting). Therefore, the MET strenuous score was calculated as: Days with strenuous activity last week  $\times$  how many minutes (on average) each day  $\times$  8. Moderate activity and walking is considered 4 times and 3.3 times as energy demanding as sitting, respectively. The MET total score, which is the measure of physical activity in this study, was calculated by summing up the scores for each of the three physical activity subtypes.

#### *Psychiatric symptoms*

The Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith 1983) consists of 14 items with subscales for anxiety and depression. The patient responds by

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indicating his or her level of agreement with the item statements on a four level scale; for instance “occasionally” (0) or “very often” (3). The score range is 0 - 21 on each of the subscales. A score of 11 or above indicate a case of clinically significant anxiety or depression, respectively, whereas a total score of 19 or above represent a case of mixed anxiety and depression. Reliability and validity of the HADS is considered good, as demonstrated by Cronbach’s alphas ranging between 0.80 and 0.93 for anxiety and between 0.81 and 0.90 for depression in various studies (Herrmann 1997). In this study, Cronbach’s alphas were 0.75 and 0.74 for anxiety and depression, respectively (Bonsaksen and Lerdal 2012).

### *Quality of life*

The World Health Organization Quality of Life – BREF (WHOQOL-BREF) (WHOQOL Group 1998) has 26 items, covering two general statements of quality of life and health, in addition to 24 statements about specific areas of importance for life satisfaction. These areas are divided into four domains: The physical, psychological, social relations and environment domains (Skevington et al. 2004). The scores on each domain were transformed on a 0-100 scale to enable comparisons between domains composed of unequal number of items. For this study, the Norwegian instrument version was employed. This translated instrument has demonstrated fairly good psychometric properties, supporting the existing factor structure with Cronbach’s alphas ranging from 0.60 (social relations domain) to 0.84 (physical domain) (Hanestad et al. 2004). Cronbach’s alphas in this study were 0.74, 0.88, 0.87, and 0.64 for the physical, psychological, social relations, and environmental domains, respectively. We utilized a sum score of all 26 items, transformed as described above, as an index of total quality of life. Cronbach’s alpha for the total quality of life index was 0.90 (Bonsaksen & Lerdal 2012).

### **Statistical analysis**

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Data were analyzed using SPSS for Windows, Version 19 (SPSS Inc. 2010). As the assumption of normality was violated for some of the variables, differences between men and women were examined with non-parametric tests (Mann-Whitney *U*-test). Similarly, non-parametric correlation analysis (Spearman's *r*) was employed to investigate the bivariate associations between the study variables. Partial correlation analysis was employed to examine relationships between sociodemographic variables and quality of life (total score and subdomain scores), controlling for depression. The level of statistical significance was  $p < 0.05$ . Due to the small sample size, however, trends ( $p < 0.10$ ) were also noticed and reported.

### **Ethics**

The study adhered to the research principles stated in the Declaration of Helsinki (World Medical Association 2008). It received approval from the Regional Ethics Committee for Medical and Healthcare Research in Oslo, Norway.

## **Results**

### **Sample characteristics**

Sociodemographic and clinical characteristics of the study sample is provided in Table 1. In total, 18 patients participated, among them 12 men (66.7 %) and six women (33.3 %). The number of patients with a schizophrenia/non-schizophrenia diagnosis was 7/5 for men and 2/4 for women. The mean age for the total sample was 44 years (SD = 13 years) (Bonsaksen 2011).

INSERT TABLE 1 ABOUT HERE

Men and women are compared with regard to clinical characteristics in Table 2. Men had significantly more global symptoms than women ( $p = 0.024$ ), and had higher overall quality of life ( $p = 0.031$ ) as well as higher quality of life in the psychological domain ( $p = 0.039$ ) and in the social relations domain ( $p = 0.040$ ). Men also trended towards having higher quality of life in the physical domain ( $p = 0.059$ ) and in the environment domain ( $p = 0.048$ ).



INSERT TABLE 2 ABOUT HERE

### **Bivariate relationships**

Table 3 shows the strength of the bivariate relationships between the study variables. With regard to gender, the correlation analysis confirmed that being male was related to experiencing higher total quality of life ( $r_s = -.52, p = 0.026$ ), as well as higher quality of life in the psychological domain ( $r_s = -.50, p = 0.034$ ) in the social relations domain ( $r_s = -.50, p = 0.036$ ), and in the environment domain ( $r_s = -.48, p = 0.044$ ). The relationship between male gender and the physical quality of life domain was borderline significant ( $r_s = -.46, p = 0.056$ ). Men had more global psychiatric symptoms than women ( $r_s = .55, p = 0.019$ ), whereas there was a trend of more depression among women as compared to men ( $r_s = .41, p = 0.091$ ).

Higher education was significantly associated with more depression ( $r_s = .50, p = 0.034$ ). There were trends that higher education was related to lower physical ( $r_s = -.46, p = 0.056$ ) and lower social ( $r_s = -.46, p = 0.053$ ) quality of life. More anxiety ( $r_s = -.70, p = 0.001$ ) and depression symptoms ( $r_s = -.69, p = 0.002$ ) were strongly associated with lower total quality of life. In addition, anxiety and depression was negatively related to the vast majority of the quality of life subdomains (Table 3).

INSERT TABLE 3 ABOUT HERE

### **Partial relationships**

In spite of non-significant gender differences for depression in this study, the results from previous studies – indicating more depression among women as compared to men – gave reason to conduct preliminary analyses of the relationships between gender and the quality of life domains, controlling for the effects from depression. When controlling for depression, the relationships between male gender and higher physical quality of life ( $r = -.01, ns$ ), higher psychological quality of life ( $r = -.28, ns$ ), higher social quality of life ( $r = -.38, ns$ ), higher environmental quality of life ( $r = -.34, ns$ ), and higher total quality of life ( $r = -.30,$

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*ns*), were all weakened. The trend of associations between more education and lower physical quality of life ( $r = -.01$ , *ns*), and between more education and lower social quality of life ( $r = -.21$ , *ns*), were similarly weakened when controlling for depression in the participants.

### Discussion

#### Summary of findings

In this sample, men had higher levels of quality of life and more severe global symptomatology as compared to women. The bivariate analysis confirmed relationships between being male and experiencing higher quality of life. When controlling for depression in the participants, these relationships were all weakened. The results indicate that the initial association between gender and quality of life may be mediated by depression levels.

#### Gender differences and associations with quality of life

The research literature suggests different courses of illness for men and women with schizophrenia (Abel, Drake, & Goldstein 2010). Among men, the time of onset is generally earlier than it is for women, and men have a more severe course of illness. It appears that men have more negative symptoms, which is often associated with a worse prognosis. This study did not assess data concerning time of onset or negative symptoms specifically. However, the lower GAF-S score among men indicates that they did have a higher severity of illness in terms of overall psychiatric symptoms when admitted to hospital treatment.

Women, on the other hand, trended towards being more depressed than their male counterparts. The very small sample size, particularly for the female group, indicates that strong caution should be taken in the interpretation of the results. However, the correspondence between the results and previous research findings (Abel, Drake, & Goldstein 2010; Bekker & van Mens-Verhulst 2007; Zender & Olshansky 2009) speak to the possibility that depression levels may be higher in women than in men, even in a sample of inpatients with mixed and severe mental illnesses such as this. The possible reasons for gender

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differences in depression levels are subject to speculation, but one salient perspective concerns a generally higher level of affectivity in women as compared to men. In this perspective, women's presentation of more depression symptoms can be viewed as a reflection of women generally being more disposed to express affect than men, rather than having different experiences with the illness (Flor-Henry 1983).

Men appeared to have higher quality of life than their female counterparts, as reflected both in the total score and in the psychological and social domains of quality of life (Table 2). Given the ambiguous associations between gender and quality of life in previous research studies (Bechdolf, Klosterkotter, Hambrecht, Knost, Kuntermann, Schiller, & Pukrop 2003; Cardoso, Caiaffa, Bandeira, Siqueira, Abreu, & Fonseca 2005; Priebe, Reininghaus, McCabe, Burns, Eklund, Hansson, Junghan, Kallert, van Nieuwenhuizen, Ruggeri, Slade, & Wang 2010; Xiang, Weng, Leung, Tang, Chan, Wang, Han, & Ungvari 2010), such large differences in quality of life between men and women were not expected in this study. It may well be that the sample poorly represents the study population, and that this has caused the discrepancy. However, clinically relevant factors that distinguish the present study in comparison to earlier studies in the field are the diagnostically mixed sample and the hospital context. The fact that more than half of the male subsample had a schizophrenia diagnosis, whereas this was the case for only two out of six females, is one relevant aspect to include when interpreting the results of this study. As previously noted, schizophrenia patients tend to have higher levels of quality of life as compared to other clinical groups (Priebe, Reininghaus, McCabe, Burns, Eklund, Hansson, Junghan, Kallert, van Nieuwenhuizen, Ruggeri, Slade, & Wang 2010). Thus, the larger proportion of schizophrenia patients in the male subsample and the smaller proportion in the female subsample may also contribute to explain these differences. What appears to be an influence from gender may alternatively be an influence from different types of illnesses. Also, studying quality of life among patients in a hospital

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context is different from what has been undertaken before. Both the context of hospital treatment, and the circumstances leading to admission, may be differently experienced by men and women. Potential differences such as these may also be related to quality of life.

The partial correlation analysis showed that the initial bivariate association between gender and quality of life was weakened when controlling for depression levels. The essence of this finding is that women in the present sample had lower quality of life than men – and that this may be caused, not by their female gender per se, but rather by their being more depressed than men. This explanation would be in line with earlier findings, emphasizing the detrimental effects from depression on quality of life among these patients (Conley, Ascher-Svanum, Zhu, Faries, & Kinon 2006; Eack & Newhill 2007; Huppert et al. 2001; Kim et al. 2010; Kugo et al. 2005; Norholm & Bech 2006; Xiang, Weng, Leung, Tang, & Ungvari 2007).

### **Education and quality of life**

Theoretically, a higher education level is assumed to associate with better health and quality of life. Schooling provides knowledge, and knowledge increases a person's ability to maintain and care for his or her own health and well-being. Empirically, a low level of education has shown to relate to low quality of life among persons with schizophrenia (Cardoso, Caiaffa, Bandeira, Siqueira, Abreu, & Fonseca 2005). This may be due to the time of illness onset. An early onset may profoundly interfere with a person's ability to keep up with school work, while it also increases the risk of more negative symptoms and a lower quality of life (Abel, Drake, & Goldstein 2010).

In this study, there were only trends towards bivariate associations between education and the physical and social quality of life subdomains. However, the trends were negative, implying that those with higher education levels experienced lower quality of life in these domains (Table 3). Depression, on the other hand, was significantly related to higher education. As was the case for gender, initial associations between education and quality of

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life were weakened when controlling for depression levels, indicating the possibility that those with higher levels of education had lower levels of quality of life due to their greater burden of depression.

One may speculate about the implications of higher education levels specific to the hospital context, as investigated in this pilot study. Although knowledge is one important means to make good decisions in life, and thereby increases a person's chances of achieving good health, it may also be that knowledge and the ability to realistically assess one's own living situation can add to the burden in some respects. There is a significant, and potentially quite burdensome, contrast between being well educated and at the same time being in need of treatment and care in a psychiatric hospital. Receiving treatment along with poorly functioning fellow patients on the ward may increase a person's feelings of hopelessness, and may add to his or her depressive symptoms. In view of this, one should not automatically consider knowledge and higher education levels exclusively as a resource for quality of life in the severely mentally ill. Insight may be a curse as well as a blessing.

Women had a higher median score of physical activity than men in this sample, but the difference was not statistically significant. Thus, at this point we assume no gender difference in physical activity levels, but again, the possibility of this result being due to type II error should be considered. Another study, using the very same sample, found no relationship between physical activity levels and quality of life (Bonsaksen & Lerdal 2012).

### **Sample size considerations**

In this sample, the effect of gender on depression was large, but still it did not meet the criteria for statistical significance (Cohen's  $d = 0.88$ ,  $p = 0.09$ ). Given the importance of depression in relation to quality of life, as shown in previous research (Eack & Newhill 2007), depression appears to be a relevant variable for sample size considerations. According to Cohen (1988), 20-25 participants in each group would be sufficient to detect statistically

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significant effects as large as we did in the present sample, given the usual estimates of  $\alpha = .05$  and a power of .80. However, obtaining such effects sizes in larger representative samples may not be realistic. Therefore, the author conservatively suggests full scale gender comparisons to include 60-70 participants in each group. This number of participants would generally be sufficient to detect statistically significant group differences with a moderate effect size ( $r = .50$ ) (Cohen 1988;Cohen 1992).

### **Study limitations**

This exploratory study is based on self-report measures from hospitalized patients with severe mental illness, and it is limited in its reporting of mainly subjective assessments. Nonetheless, in spite of participants' severe illness and their associated functional limitations, it is suggested that research with severely mentally ill patients generally can achieve high reliability and validity of results (Bell et al. 2007;Voruganti et al. 1998). In addition, data were collected flexibly as self-report or as a collaborative interview as appropriate with each participant, a procedure strengthening the validity of the findings.

The small study sample – the female subsample in particular – indicates a high risk of making Type II errors; i.e., not detecting effects that exist in the data. The moderate to large differences between male and female participants found in this study, combined with low probability for these differences, support this consideration (Cohen 1988). Thus, it is emphasized that the results from this study must be considered preliminary. However, to the best of the author's knowledge, this is the first study to focus on the role of gender in relationship to quality of life in hospitalized patients with severe mental illness.

Future studies in the field should preferably collect data from substantially larger samples and should be able to use more sophisticated statistical analyses (e.g., multiple regression analysis). In this study, only depression levels were controlled for, and other confounding variables may be important to consider when examining the relationship

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between gender and quality of life in the severely mentally ill. Confounder variables of interest may be related to the person as well as his or her environment (Bigelow et al. 1991;Katschnig et al. 2006). Psychiatric symptoms may be only one out of several factors contributing to quality of life. Other factors of importance may concern self-esteem (Rosenberg 1965), self-efficacy (Bandura 1997), or sense of coherence in life (Antonovsky 1987). Environment factors of interest may relate to the quality of relationships and the possibilities for a meaningful occupational life in the community (Mezzina et al. 2006;Topor et al. 2006).

### **Conclusion**

The present study adds to the knowledge concerning gender and its relationship to physical activity, psychiatric symptoms, and quality of life among hospitalized patients with severe mental illness. Female gender was initially associated with lower quality of life, but this association partly depended on the higher depression levels in women as compared to men. More depression among women corresponds with the existing research literature, as does the strong association of depression with decreased quality of life. Attention to depressive symptomatology is therefore an important aspect of treatment and care for persons with severe mental illness, and clinicians should be aware that women may be particularly vulnerable to depression.

References

- Abel, K.A., Drake, R., & Goldstein, J.M. 2010. Sex differences in schizophrenia. *International Review of Psychiatry*, 22, (5) 417-428
- American Psychiatric Association 1994. *Diagnostic and Statistical Manual of Mental Disorders*, 4 ed. Washington, DC, American Psychiatric Association.
- Antonovsky, A. 1987. *Unraveling the mystery of health: how people manage stress and stay well* San Francisco, Jossey-Bass.
- Bandura, A. 1997. *Self-efficacy: The exercise of control* New York, W.H. Freeman and Company.
- Bechdolf, A., Klosterkötter, J., Hambrecht, M., Knost, B., Kuntermann, C., Schiller, S., & Pukrop, R. 2003. Determinants of subjective quality of life in post acute patients with schizophrenia. *European Archives of Psychiatry and Clinical Neuroscience*, 253, (5) 228-235
- Bekker, M.H.J. & van Mens-Verhulst, J. 2007. Anxiety Disorders: Sex Differences in Prevalence, Degree, and Background, But Gender-Neutral Treatment. *Gender Medicine*, 4, (suppl. B) 178-193
- Bell, M., Fiszdon, J., Richardson, R., Lysaker, P., & Bryson, G. 2007. Are self-reports valid for schizophrenia patients with poor insight? Relationship of unawareness of illness to psychological self-report instruments. *Psychiatry Research*, 151, (1-2) 37-46
- Biddle, S. & Mutrie, N. 2008. *Psychology of Physical Activity. Determinants, well-being and interventions.*, 2 ed. London/New York, Routledge/Taylor & Francis Group.



## Exploring Gender Differences in Quality of Life

Bigelow, D.A., McFarland, B.H., & Olson, M.M. 1991. Quality of life of community mental health program clients: Validating a measure. *Community Mental Health Journal*, 27, 43-55

Bonsaksen, T. 2011. Participation in Physical Activity among Inpatients with Severe Mental Illness: A Pilot Study. *International Journal of Therapy and Rehabilitation*, 18, (2) 91-99

Bonsaksen, T. & Lerdal, A. 2012. Relationships between physical activity, symptoms and quality of life among inpatients with severe mental illness. *British Journal of Occupational Therapy*, 75, (2) 69-75

Brown, S., Birtwistle, J., Roe, L., & Thompson, C. 1999. The Unhealthy Lifestyle of People with Schizophrenia. *Psychological Medicine* (29) 697-701

Cardoso, C.S., Caiaffa, W.T., Bandeira, M., Siqueira, A.L., Abreu, M.N.S., & Fonseca, J.O.P. 2005. Factors associated with low quality of life in schizophrenia. *Caderno de Saude Publica*, 21, (5) 1338-1348

Chafetz, L., White, M.C., Collins-Bride, G., Nickens, J., & Cooper, B.A. 2006. Predictors of Physical Functioning Among Adults With Severe Mental Illness. *Psychiatric Services*, 57, (2) 225-231

Cohen, J. 1988. *Statistical power analysis for the behavioral sciences*, 2 ed. Hillsdale, NJ, Lawrence Erlbaum Associates.

Cohen, J. 1992. A Power Primer. *Psychological Bulletin*, 112, (1) 155-159

Conley, RR., Ascher-Svanum, H., Zhu, B., Faries, DE., & Kinon, B.J. 2006. The burden of depressive symptoms in the long-term treatment of patients with schizophrenia. *Schizophrenia Research*, 90, 186-197

## Exploring Gender Differences in Quality of Life

Daumit, G.L., Goldberg, R.W., Anthony, C., Dickerson, F., Brown, C.H., Kreyenbuhl, J., Wohlheiter, K., & Dixon, L.B. 2005. Physical Activity Patterns in Adults With Severe Mental Illness. *Journal of Nervous and Mental Disease*, 193, (10) 641-646

Eack, S.M. & Newhill, C.E. 2007. Psychiatric Symptoms and Quality of Life in Schizophrenia: A Meta-Analysis. *Schizophrenia Bulletin*, 33, (5) 1225-1237

Flor-Henry, P. 1983, "The influence of gender on psychopathology," *In Cerebral basis of psychopathology*, P. Flor-Henry, ed., Littleton, MA: Wright-PSG, pp. 97-116.

Hanestad, B., Rustøen, T., Knudsen, Ø., Lerdal, A., & Wahl, A.K. 2004. Psychometric Properties of the WHOQOL-BREF Questionnaire for the Norwegian General Population. *Journal of Nursing Measurement*, 12, (2) 147-159

Herrmann, C. 1997. International experiences with the hospital anxiety and depression scale - a review of validation data and clinical results. *Journal of Psychosomatic Research*, 42, (1) 17-41

Huppert, J.D. & Smith, T.E. 2005. Anxiety and schizophrenia: the interaction of subtypes of anxiety and psychotic symptoms. *CNS Spectrum*, 10, (9) 721-731

Huppert, J.D., Weiss, K.A., Lim, R., Pratt, S., & Smith, T.E. 2001. Quality of life in schizophrenia: contributions of anxiety and depression. *Schizophrenia Research*, 51, 171-180

IPAQ committee. Guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ). <http://www.ipaq.ki.se/scoring.htm> . 2005.

Ref Type: Electronic Citation

Katschnig, H., Freeman, H., & Sartorius, N. Quality of life in mental disorders. 2. 2006. Chichester, England, John Wiley & Sons Ltd.

## Exploring Gender Differences in Quality of Life

Ref Type: Edited Book

Kim, J., Ann, JH., & Kim, M.J. 2010. The relationship between depressive symptoms and subjective well-being in newly admitted patients with schizophrenia. *Comprehensive Psychiatry*, 51, 165-170

Kugo, A., Terada, S., Ishizu, H., Takeda, T., Sato, S., Habara, T., Fujimoto, Y., amba, T., orii, S., & uroda, S. 2005. Quality of life for patients with schizophrenia in a Japanese psychiatric hospital. *Psychiatry Research*, 144, 49-56

McCreadie, R.G. 2003. Diet, smoking, and cardiovascular risk in people with schizophrenia. *British Journal of Psychiatry*, 183, 534-539

Mezzina, R., Davidson, L., Borg, M., Marin, I., Topor, A., & Sells, D. 2006. The social nature of recovery: discussion and implications for practice. *American Journal of Psychiatric Rehabilitation*, 9, (1) 63-80

Morgan, V.A., Castle, D.J., & Jablensky, A.V. 2008. Do women express and experience psychosis differently from men? Epidemiological evidence from the Australian National Study of Low Prevalence (Psychotic) Disorders. *Australian and New Zealand Journal of Psychiatry*, 42, 74-82

Norholm, V. & Bech, P. 2006. Quality of life in schizophrenic patients: association with depressive symptoms. *Nordic Journal of Psychiatry*, 60, 32-37

Priebe, S., Reininghaus, U., McCabe, R., Burns, T., Eklund, M., Hansson, L., Junghan, U., Kallert, T., van Nieuwenhuizen, C., Ruggeri, M., Slade, M., & Wang, D. 2010. Factors influencing subjective quality of life in patients with schizophrenia and other mental disorders: A pooled analysis. *Schizophrenia Research*, 121, 251-258

## Exploring Gender Differences in Quality of Life

Rosenberg, M. 1965. *Society and the adolescent self-image* Princeton, NJ, Princeton University Press.

Skevington, S.M., Lofty, M., & O'Connell, K.A. 2004. The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial. A Report from the WHOQOL Group. *Quality of Life Research*, 13, 299-310

Sokal, J., Messias, E., Dickerson, F., Kreyenbuhl, J., Brown, C., Goldberg, R., & Dixon, L. 2004. Comorbidity of medical illnesses among adults with serious mental illness who are receiving community psychiatric services. *Journal of Nervous and Mental Disease*, 192, (6) 421-427

SPSS Inc. SPSS for Windows. [19]. 2010. Chicago, IL.

Ref Type: Computer Program

Thornicroft, G., Leese, M., Tansella, M., Howard, L., Toulmin, H., Herran, A., & Schene, A. 2002. Gender differences in living with schizophrenia. A cross-sectional European multi-site study. *Schizophrenia Research*, 57, 191-200

Topor, A., Borg, M., Mezzina, R., Sells, D., Marin, I., & Davidson, L. 2006. Others: the role of family, friends, and professionals in the recovery process. *American Journal of Psychiatric Rehabilitation*, 9, (1) 17-37

Voruganti, L., Heslegrave, R., Awad, A.G., & Seeman, M.V. 1998. Quality of life measurement in schizophrenia: reconciling the quest for subjectivity with the question of reliability. *Psychological Medicine*, 28, (1) 165-172

## Exploring Gender Differences in Quality of Life

WHOQOL Group 1998. Development of the World Health Organization WHOQOL- BREF quality of life assessment. *Psychological Medicine*, 28, 551-558

World Medical Association 2008. *WMA Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects*. World Medical Association.

Xiang, Y.-T., Weng, Y.-Z., Leung, C.-M., Tang, W.-K., Chan, S.S.M., Wang, C.-Y., Han, B., & Ungvari, G. 2010. Gender differences in sociodemographic and clinical characteristic and the quality of life of Chinese schizophrenia patients. *Australian and New Zealand Journal of Psychiatry*, 44, 450-455

Xiang, YT., Weng, YZ., Leung, CM., Tang, WK., & Ungvari, G.S. 2007. Quality of life of Chinese schizophrenia outpatients in Hong Kong: relationship to sociodemographic factors and symptomatology. *Australian and New Zealand Journal of Psychiatry*, 41, 442-449

Zender, R. & Olshansky, E. 2009. Women's Mental Health: Depression and Anxiety. *Nursing Clinics of North America*, 44, (3) 355-364

Zigmond, A.S. & Snaith, R.P. 1983. The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, 67, (6) 361-370

## Exploring Gender Differences in Quality of Life

Table 1

*Characteristics of the total sample at admission (N = 18)*

<i>Sociodemographic characteristics</i>	N	%
Male/Female	12/6	66.6/33.3
Source of income		
Disability pension	11	61.1
Illness/rehabilitation/social benefits	7	39.0
Education		
< 12 years	12	66.7
12 years or more	6	33.3
Custody of children (yes/no)	1/17	5.6/94.4
Relationships		
In relationship/not in relationship	0/18	0/100
<i>Clinical characteristics</i>		
ICD-10 Diagnosis		
Schizophrenia	9	50.0
Bipolar disorder	2	11.1
Paranoid psychosis	3	16.7
Other <sup>1</sup>	4	22.4
Illness duration		
5 years or less	5	27.8
6 – 10 years	4	22.2
> 10 years	9	50.0

*Note.* <sup>1</sup> Other diagnoses were major depression (n = 1), schizotypal disorder (n = 1),

unspecified developmental disorder (n=1), and borderline personality disorder (n = 1). Table

## Exploring Gender Differences in Quality of Life

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## Exploring Gender Differences in Quality of Life

Table 2

*Differences between men (n = 12) and women (n = 6) in the sample*

Measures	Scale	Men	Women	
<i>Sociodemographic</i>		<i>Md (range)</i>	<i>Md (range)</i>	<i>p</i>
Age		47.0 (42.0)	46.5 (34.0)	1.00
		N (%)	N (%)	
Education > 12 years		3.0 (25.0)	3.0 (50.0)	0.30
<i>Global functioning (GAF)</i>		<i>Md (range)</i>	<i>Md (range)</i>	
GAF symptoms	0-100	30.0 (23.0)	41.0 (13.0)	0.02
GAF function	0-100	31.5 (25.0)	35.0 (12.0)	0.11
<i>Psychiatric symptoms</i>				
Anxiety	0-21	9.0 (17.0)	11.0 (11.2)	0.13
Depression	0-21	9.0 (13.0)	14.3 (13.0)	0.09
<i>Physical activity</i>				
Total MET score		831 (3330)	1287 (4506)	0.57
<i>Quality of life</i>				
Physical	0-100	66.1 (71.4)	46.4 (39.3)	0.06
Psychological	0-100	64.6 (70.8)	29.2 (45.8)	0.04
Social	0-100	66.7 (79.2)	25.0 (33.3)	0.04
Environment	0-100	57.8 (69.2)	36.6 (34.4)	0.05
Total	0-100	63.5 (68.1)	38.8 (24.0)	0.03

*Note.* Table content is median values (Md), observed score range (range), and probability (*p*) of differences between men and women by Mann-Whitney *U*-tests.



Table 3

*Bivariate relationships between sociodemographic variables, psychiatric symptoms, physical activity, and quality of life at admission (N = 18)*

	Gender	Age	Education	GAF-S	GAF-F	Anxiety	Depression
Age	.00	-	-	-	-	-	-
Education	.25	.17	-	-	-	-	-
GAF-S	.55*	-.01	.32	-	-	-	-
GAF-F	.39	-.20	.20	.73**	-	-	-
Anxiety	.37	.32	.10	.22	-.24	-	-
Depression	.41	-.06	.50*	.74**	.44	.44	-
Physical activity	.14	.06	.21	.23	.16	.14	.19
Physical QOL	-.46	-.14	-.46	-.25	-.03	-.68**	-.70**
Psychological QOL	-.50*	-.05	-.40	-.47*	-.20	-.70**	-.77**
Social QOL	-.50*	-.16	-.46	-.30	-.10	-.58*	-.59*
Environment OQL	-.48*	-.04	.07	-.22	-.12	-.62**	-.42
Total QOL	-.52*	-.05	-.38	-.31	-.12	-.70**	-.69**

	Physical activity	Physical QOL	Psychological QOL	Social QOL	Environment OQL
Physical QOL	-.12	-	-	-	-
Psychological QOL	-.25	.86**	-	-	-
Social QOL	-.09	.85**	.76**	-	-
Environment OQL	-.04	.75**	.59*	.64**	-
Total QOL	-.13	.97**	.92**	.88**	.78**

*Note.* Table content is Spearman's  $r$  correlation coefficients. Gender was coded male = 1, female = 2. GAF is the Global Assessment of

Functioning score with split scores for function and symptoms. Physical activity is MET (metabolic equivalent task) scores derived from the

International Physical Activity Questionnaire. Anxiety and depression are symptom scores derived from the Hospital Anxiety and Depression

Scale. Quality of life (QOL) is the transformed sum score on the WHO Quality of Life – BREF; total score and subdomain score.

\*\* $p < 0.01$ , \* $p < 0.05$